

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-6 (Cancelled).

7. (Currently amended) The method as claimed in claim ~~[[6]]~~ 8, wherein the first TCP/IP connection is concurrent with the second TCP/IP connection.

8. (Currently amended) ~~The method as claimed in claim 6,~~ In a data processing network including a client and a file server, a method of access to a storage object in the file server, said method comprising:

the client using a block level access protocol over the network to access the storage object; and

the file server accessing the storage object by accessing a file containing data of the storage object;

which includes the file server copying the file over the network concurrent with the step of the client using the block level access protocol over the network to write data to the storage object;

wherein the network is an IP network, the client uses the block level protocol over a first TCP/IP connection over the network to access the storage object, and the client initiates the step of the copying of the file by sending a command over a second TCP/IP connection; and

which includes the step of the client pausing the step of writing of data to the storage object after a commit operation, and during the pause, the client performing the step of initiating the copying of the file by sending the command over the second TCP/IP connection.

9. (Currently amended) The method as claimed in ~~claim 1~~ claim 8, which includes the file server also providing access to the storage object over the network by means of a file access protocol over the network, the file access protocol accessing the file containing the data of the storage object.

10. (Currently amended) The method as claimed in claim 9, wherein ~~the client uses a UNIX or Linux operating system,~~ and the file access protocol is the Network File System (NFS) protocol NFS.

11. (Currently amended) The method as claimed in claim 9, wherein ~~the client uses a Windows operating system,~~ and the file access protocol is the Common Internet File System (CIFS) protocol CIFS.

Claims 12-18 (cancelled).

19. (Currently amended) The method as claimed in claim [[18]] 20, wherein the first TCP/IP connection is concurrent with the second TCP/IP connection.

20. (Currently amended) ~~The method as claimed in claim 18,~~ In a data processing network including a client and a file server, a method of access to a virtual direct access storage device in the file server, attributes and data of the virtual direct access storage device being stored in at least one file in the file server, said method comprising:

the client using a block level access protocol over the network to access the virtual direct access storage device in the file server, the file server responding to commands in accordance with the block level access protocol for access to the virtual direct access storage device by accessing the attributes and data of the virtual direct access storage device; and

the file server providing access over the network to the virtual block storage device in accordance with a file access protocol by accessing said at least one file in the file server

which includes the step of the file server copying the data of the virtual direct access storage device over the network concurrent with the client using the block level access protocol over the network to write new data to the virtual direct access storage device;

wherein the network is an IP network, the client uses the block level protocol over a first TCP/IP connection over the network to access the virtual direct access storage device, and the client initiates the step of copying of said at least one file by sending a command over a second TCP/IP connection.; and

which includes the step of the client pausing the writing of the new data to the virtual direct access storage device after a commit operation, and during the pause, the client performs

the step of initiating the copying of the data of the virtual direct access storage device by sending the command over the second TCP/IP connection.

21. (Currently amended) The method as claimed in claim [[14]] 20, wherein the network is an IP network, and the block level access protocol is the Small Computer System Interface (SCSI) protocol SCSI.

22. (Currently amended) The method as claimed in claim [[14]] 20, wherein ~~the client uses a UNIX or Linux operating system,~~ and the file access protocol is the Network File System (NFS) protocol NFS.

23. (Currently amended) The method as claimed in claim [[14]] 20, wherein ~~the client uses a Windows operating system,~~ and the file access protocol is the Common Internet File System (CIFS) protocol CIFS.

Claims 24-26 (Cancelled).

27. (Currently amended) [The network file server as claimed in claim 24,]

A network file server comprising:

data storage;

an interface for coupling the data storage to a data network; and

at least one processor programmed for permitting clients in the data network to access the data storage in accordance with a plurality of access protocols;

the data storage containing at least one file for storing file attributes and for storing metadata defining a virtual direct access storage device and for storing data of the virtual direct access storage device;

the access protocols including at least one block level access protocol for access to the virtual direct access storage device by accessing the metadata and data of the virtual direct access storage device; and

the access protocols including at least one file access protocol for accessing said at least one file;

wherein the metadata includes attributes of the virtual direct access storage device, and the attributes of the virtual direct access storage device and the data of the virtual direct access storage device are stored together in a single file;

wherein the metadata includes attributes of the virtual SCSI direct access storage device, and the attributes of the virtual SCSI direct access storage device and the data of the virtual SCSI direct access storage device are stored together in a single file; and

wherein the metadata includes attributes of the virtual SCSI direct access storage device, and the attributes of the virtual SCSI direct access storage device specify include a specification of an internal organization of the virtual SCSI direct access storage device, and the specification of the internal organization of the virtual SCSI direct access storage device is stored in the single file.

28. (Original) The network file server as claimed in claim 27, wherein the specified internal organization of the virtual direct access storage device includes a RAID level.

29. (Original) The network file server as claimed in claim 27, wherein the specified internal organization of the virtual direct access storage device includes a striping pattern.

30. (Currently amended) The network file server as claimed in claim ~~[[24]]~~ 27, which includes a snapshot copy facility for copying the data of the virtual direct access storage device over the network concurrent with ~~a client~~ one of said clients using the block level access protocol over the network to write new data to the virtual direct access storage device.

31. (Currently amended) The network file server as claimed in claim 30, wherein the interface is an IP interface, and the network file server is programmed to permit said one of the clients the client to write the new data to the virtual direct access storage device using the block level access protocol over a first TCP/IP connection over the network for the writing of the new data to the virtual direct access storage device, and the network file server is programmed to initiate the copying of the file containing the data of the virtual direct access storage device over the network upon receipt of a command from the client over a second TCP/IP connection over the network.

32. (Original) The network file server as claimed in claim 31, wherein the network file server is programmed so that the first TCP/IP connection is concurrent with the second TCP/IP connection.

33. (Currently amended) The network file server as claimed in claim [[24]] 27, wherein the interface is an IP interface, and wherein the network file server includes an IP replication facility for replicating files from the data storage over the network.

34. (Currently amended) The network file server as claimed in claim [[24]] 27, wherein the interface is an IP interface, and the block level access protocol is the Small Computer System Interface (SCSI) protocol ~~SCSI~~.

35. (Currently amended) The network file server as claimed in claim [[24]] 27, wherein the file access protocol is the Network File System (NFS) protocol ~~NFS~~.

36. (Currently amended) The network file server as claimed in claim [[24]] 27, wherein the file access protocol is the Common Internet File System (CIFS) protocol ~~CIFS~~.

Claims 37-39 (Cancelled).

40. (Currently amended) ~~The network file server as claimed in claim 37,~~

A network file server comprising:

data storage;

an interface for coupling the data storage to an IP data network; and

at least one processor programmed for permitting clients in the data network to access the
data storage in accordance with a plurality of access protocols;

the data storage containing at least one file for storing file attributes and for storing metadata
defining a virtual Small Computer System Interface (SCSI) direct access storage device and for
storing data of the virtual direct access storage device;

the access protocols including a block level access protocol for permitting at least one of
said clients to access the virtual SCSI direct access storage device over the IP network by
accessing the metadata and data of the virtual direct access storage device;

the access protocols including at least one file access protocol for accessing said at least
one file; and

the network file server includes a facility for remote replication of said at least one file
over the IP network concurrent with write access of said at least one of said clients to the virtual
SCSI direct access device over the IP network using the block level access protocol;

wherein the metadata includes attributes of the virtual SCSI direct access storage device,
and the attributes of the virtual SCSI direct access storage device and the data of the virtual SCSI
direct access storage device are stored together in a single file; and

wherein the metadata includes attributes of the virtual SCSI direct access storage device,
and the attributes of the virtual SCSI direct access storage device specify include a specification
of an internal organization of the virtual SCSI direct access storage device, and the specification

of the internal organization of the virtual SCSI direct access storage device is stored in the single file.

41. (Original) The network file server as claimed in claim 40, wherein the specified internal organization of the virtual SCSI direct access storage device includes a RAID level.

42. (Original) The network file server as claimed in claim 40, wherein the specified internal organization of the virtual SCSI direct access storage device includes a striping pattern.

43. (Currently amended) The network file server as claimed in claim ~~[[37]]~~ 40, wherein the network file server is programmed to permit ~~a-client~~ said at least one of said clients to write new data to the virtual SCSI direct access storage device using the block level access protocol over a first TCP/IP connection over the network, and the network file server is programmed to initiate remote replication of said at least one file upon receipt of a command from ~~the-client~~ said at least one of said clients over a second TCP/IP connection over the network.

44. (Original) The network file server as claimed in claim 43, wherein the network file server is programmed so that the first TCP/IP connection is concurrent with the second TCP/IP connection.

45. (Currently amended) The network file server as claimed in claim ~~[[37]]~~ 40, wherein said at least one file access protocol includes the Network File System (NFS) protocol ~~NFS~~.

46. (Currently amended) The network file server as claimed in claim [[37]] 40, wherein said at least one file access protocol includes the Common Internet File System (CIFS) protocol CIFS.

47. (Currently amended) The network file server as claimed in claim [[37]] 40, wherein the block-level access protocol includes the Small Computer System Interface (SCSI) SCSI protocol.

48. (Currently amended) The network file server as claimed in claim [[37]] 40, wherein the ~~block-level~~ block-level access protocol includes the Small Computer System Interface (SCSI) over IP iSCSI protocol.

49. (Currently amended) The network file server as claimed in claim [[37]] 40, which includes a snapshot copy facility for creating snapshot copies of said at least one file, and wherein the snapshot copy facility is coupled to the facility for remote replication for transmission of data from the snapshot copies over the IP network concurrent with client write access to the virtual SCSI direct access device over the IP network using the block level access protocol.